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MEMORANDUM

To: Gil Paquette
From: Art Gilman
Date: 8 February 2005
Re: Bangor Hydro 345 kV project, Botanical Resources and Natural Communities

I. Introduction

Bangor-Hydro proposes to construct a new 345 kV powerline from Baileyville to Orrington, Maine for a distance of approximately 85 miles. The powerline will run on wood H-frame structures generally spaced about 800' apart and centered in a 150'-170' wide corridor, except that from Bradley south to Orrington, the corridor will be partially shared with existing powerlines and will consist of an additional 100'-125' of cleared corridor. The majority of the corridor between Baileyville and Great Pond, a distance of some 55 miles, will be immediately adjacent to the Maritimes & Northeast Pipeline corridor, and/or Stud Mill Road, a private haul road. From Bradley south to the Orrington substation, some 18 miles, it will also run adjacent to the existing MEPCO transmission line corridor. Additional areas will include laydown or construction yards and access roads.

In the 1980's and 1990's, I conducted the rare plant and natural communities review for Bangor-Hydro's prior proposal to locate this transmission line generally parallel to but offset from Stud Mill Road. In addition, in 1998, I conducted the rare plant and natural communities review for the Maritimes & Northeast Pipeline project, which is located along much of the same corridor now proposed by Bangor-Hydro for its transmission line.

Certain rare plants are protected under federal law (50 CFR 17.12). Three federally-listed species occur in Maine: Furbish's lousewort (*Pedicularis furbishiae*), prairie white-fringed orchid (*Platanthera leucophaea*) and small whorled pogonia (*Isotria medeoloides*).

These plants and others are protected under Maine state law (5 MRSA §13076-13079). The latest revised "Official List of Endangered and Threatened Plants in Maine" was adopted 13 July 1999. A total of 90 endangered and 100 threatened species are listed. The Maine Natural Areas Program (MNAP 2004a) has proposed another 76 species as threatened or endangered, and furthermore, tracks another 104 species of "special

concern." Altogether, the Maine list of rare plants totals some 370 species. MNAP also tracks approximately 144 natural communities in Maine (MNAP, 2004b), of which 39 are ranked as rare in the state.

This report summarizes my findings on the rare plants and natural communities located along or likely to be found along the corridor proposed by Bangor-Hydro for its transmission line project. This report does not include an evaluation of the construction access roads, laydown areas, and staging areas, which will be identified at a later date. However, to date all access roads, laydown areas, and staging areas are existing, pre-disturbed areas.

II. Methodology

Because of my involvement with Bangor-Hydro's previously proposed route as well as the Maritimes & Northeast pipeline project, I am very familiar with the project's environs, the habitats that occur along the corridor, and the nature of its plant communities. Indeed, many of the known locations of rare, threatened, or endangered plants for the involved townships are the result of my prior investigations.

Resource maps for the project area were reviewed, including surficial and bedrock geology maps, soils maps, and wetlands maps. Special reference was made to maps provided by MNAP as to locations of rare species or communities (see project topographic maps). Aerial photographs of the proposed corridor were reviewed.
Botanical literature pertinent to the region was also reviewed, including recent lists of the Maine flora (Haines and Vining, 1999) and the most recent list of Maine plant species of concern (MNAP 2004a), and fact sheets for species of concern (MNAP 1999). Natural communities identified along the project corridor were compared to descriptions of rare communities published by MNAP (2004b).

Additional searches and site visits to known populations were undertaken in the project area in early September 2003 and in early October 2004. Habitat-based searches were also conducted in areas of proposed project reroutes, especially where reroutes were located near known sites or significant community types. Sites of the laydown or staging areas are not yet known and will be evaluated when defined; if the potential exists for rare plant species to occur, they will be searched in summer 2005.

Preliminary results were discussed with staff of the Maine Natural Areas Program at a meeting on 7 February 2005.

III. Results

IIIa. Rare Plants

Of the three federally-listed plants that occur in Maine, none are known or likely to occur in the vicinity of the project corridor. Furbish's lousewort is known only from the valley of the St. John River, more than 150 miles to the north; prairie white-fringed orchid is

only known from one site in Maine, a rich fen approximately 70 miles north of the project, and small whorled pogonia is only known in the western portion of the state, with the closest known station about 90 miles southwest of Orrington.

Of state-listed species, 11 rare species are known to occur near or within the proposed corridor (Table 1). I have observed 3 species within the corridor itself:

- Sheathed sedge, *Carex vaginata*, is listed of Special Concern. It occurs abundantly in a northern white cedar swamp at the south end of Sawtelle Heath in Baileyville, where the powerline corridor will be cleared along one side (Figure 1). Sheathed sedge is ranked S3 ("rare in Maine, on the order of 20-100 occurrences") by MNAP and is generally found in cedar swamps and other areas of calcareous groundwater influence (Fernald and Wiegand, 1910; FNA, 2003). Staff of MNAP indicated in discussions that this species may soon be re-ranked as S4, i.e., of less concern, because it has recently been found more commonly than earlier records indicated.

- Showy lady's-slipper, *Cypripedium reginae*, is listed as Threatened in Maine, and is also ranked S3. Because of its showy flowers, it is sometimes considered at risk of collection for gardens and over-picking (CAP, 1981; MNAP, 1999). It requires wet, calcareous soils and is usually associated with northern white cedar swamps. On the project, showy lady's-slipper occurs along with sheathed sedge in a swamp in Baileyville, along one side of the proposed corridor (Figure 1). This station was first reported by Gilman and Countryman (1991). Of note, both this species and sheathed sedge - and several others (see Table 1) - occur in another nearby cedar swamp located on the <u>other</u> side of the proposed corridor, and south of the Maritimes & Northeast Pipeline corridor.

- Alga-like pondweed, *Potamogeton confervoides*, is listed of Special Concern, and is also ranked S3. This species is known from Allen Brook in T35 MD. A large population occurs in the stream on the south side of the Stud Mill Road, and a number of plants were transplanted downstream to the north side of the road (i.e. within the proposed corridor) as mitigation for the Maritimes & Northeast Pipeline project. None were observed in the stream north of the road during fieldwork in October 2004 (probably due to high water which limited observations to a small area near the road). Numerous plants were observed on the south side of the Stud Mill Road, however, so the population is considered extant. Alga-like pondweed requires very soft, often acidic water (MNAP, 1999).

A fourth species, white adder's-mouth orchis (*Malaxis monophyllos*), was found within the previously proposed corridor, located on the south side of the Maritimes & Northeast pipeline corridor in Twp. 27 ED. Searches for the small population failed to find it in 1997, 2000, 2003, and 2004. In any case, the corridor as now proposed bypasses the area.

The remaining seven species known from the vicinity are, to the best of my knowledge, outside of the proposed corridor and not along proposed access roads.

IIIb. Rare Natural Communities

- Near the eastern end of the project, the Sawtelle Heath area in Baileyville is mapped by MNAP as a "significant ecosystem." Although some parts of this area are domed, the entire system is characterized by MNAP as a large "raised level bog ecosystem" which is ranked S4, and is surrounded by conifer forest. The project runs along the system's southern margin, and encroaches, primarily on a northern white cedar swamp, a community that is ranked S4 by MNAP. This community has populations of the rare species noted above, sheathed sedge and showy lady's-slipper. However, these species occur outside of the area that is mapped, while the area that is mapped does not support these species. There is additional, and more distinctive, northern white cedar swamp habitat south of the pipeline corridor. It should be noted that a natural community identified in materials obtained from MNAP - "low sedge - buckbean fen lawn" was not observed in the vicinity of the proposed project.

- Birch Stream Bog is a large peatland area, i.e., another "domed bog ecosystem" also mapped by MNAP as a significant ecosystem. The project as proposed does not pass over any peatland area. Where it crosses Birch Stream is downstream of the bog in an area with "alder shrub thicket" and "mixed graminoid-shrub marsh" communities, both of which are ranked S5 by MNAP. A segment also passes through a swampy black spruce forest, i.e., part of the forest zone that surrounds the peatland itself. This community is named "spruce-fir-cinnamon fern forest" by MNAP and is ranked S4.

IV. Discussion

IVa. Rare plants

In general, the project avoids impacts to rare plants, with populations of only three species being known to occur within the proposed corridor.

- Sheathed sedge - This is normally a plant of semi-shaded conditions. MNAP's "conservation considerations" (MNAP 1999) state: "it is likely that canopy openings could favor this species…[but] complete removal of the canopy over a large area… could produce drastic habitat changes that would be detrimental to this plant."

- Showy lady's-slipper - This species thrives in sunshine and I have observed it in powerline corridors in both Maine (Glenwood, Aroostook County) and in northern Vermont. MNAP's "conservation considerations" for this species (MNAP 1999) state, "partial removal of the canopy can benefit the populations, if done correctly."

Both sheathed sedge and showy lady's-slipper could be protected by avoiding structure placements or access roads within the populations, and by judicious clearing and

maintenance practices. Clearing should be done in winter conditions with snow cover of 6" or more, and should remove all trees, except should leave young northern white cedar (*Thuja occidentalis*) up to 8' tall. This species is slow growing and is unlikely to interfere with conductor safety zones during a normal maintenance cycle (typically years) if left at this size. These will provide dappled shade within the corridor conducive to maintaining the population of sheathed sedge. Again, it should be noted that this species is now considered less rare than previously, i.e., S4 not S3 rank. I have observed populations of showy lady's-slippers in powerline corridors in both Maine and Vermont, and attest that this species thrives in sunshine in such situations. However, this species will not be adversely affected by leaving some shade, as recommended for sheathed sedge. The area of the population and its immediate environs (50' buffer) should be maintained without herbicides.

The third species within the corridor, alga-like pondweed, being purely aquatic should not be impacted by the project since there will be no work done in Allen Brook. MNAP's "conservation considerations" for this species (MNAP 1999) recommend: "maintain water quality of the ponds in which it occurs." There would be no conflict arising from the proposal with this recommendation. Allen Brook is open to the sun and will not have any additional clearing along its banks. The nearest structure placement will be more than 100' feet from the stream, and there will be no need to cross the stream with a new access road. Furthermore, vegetation along the stream is low and will require only very limited (if any) maintenance; if this can be done when necessary by mechanical means rather than herbicides, there should be no diminution of water quality and no impact to the species.

IVb. *Rare Natural Communities*

The significant ecosystems near Sawtelle Heath and near Birch Stream Bog would not be impacted because the corridor will pass near but not across them, through community types that are rated common (S4 or S5). Furthermore, management of a powerline corridor in their vicinity would not foreseeably change hydrology or vegetative communities so as to alter these larger off-site systems; this is especially so at Birch Stream Bog, where the project will cross Birch Stream downstream of the bog.

V. Conclusions

In my experience, powerline corridors in northern New England provide habitat for many rare species of plants. If the project is routed as currently proposed, is maintained as planned, and the precautions described above are taken, there should be no adverse impacts to the known botanical resources that would result.

VI. Literature Cited

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Table 1. Rare plants known near the project corridor. Ones that are shaded occur within the corridor itself.

MP	Town	Scientific Name	Common Name	Rank[1]	Status[2]	Notes
	Baileyville	*Juncus vaseyi*	Vasey's sedge	S1	E	
	Baileyville	*Betula pumila*	Bog birch	S2		
	Baileyville	*Carex vaginata*	Sheathed sedge	S3/4[3]	SC	
	Baileyville	*Carex tenuiflora*	Sparse-flowered sedge	S2	SC	
	Baileyville	*Cypripedium reginae*	Showy lady's-slipper	S3	T	
	Baileyville	*Lonicera oblongifolia*	Swamp fly-honeysuckle	S3	SC	
	Baileyville	*Galium labradoricum*	Bog bedstraw	S2	SC	
	Princeton	*Hippuris vulgaris*	Mare's-tail	S3	SC	In Lewys Brook
	T27 ED	*Malaxis monophyllos*	White adder's-mouth	S1	E	Not observed in 2003 or 2004
	T35 MD	*Potamogeton confervoides*	Alga-like pondweed	S3	SC	Allen Brook
	Great Pond	*Cyperus squarrosus*	Awned sedge	S1	SC	

[1]Ranks are assigned by MNAP as follows:

S1 = "Critically imperiled in Maine because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the state"

S2 = "Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline."

S3 = "Rare in Maine (on the order of 20-100 occurrences)."

[2] Status: T = Threatened under Maine Statute, E = Endangered under Maine statute, SC = Special Concern, an informational status only

[3] Sheathed sedge will soon be re-ranked as S4 because numerous additional populations have been found in Maine (MNAP, pers. comm.).